

## A New Gobiid Fish, *Stonogobiops pentafasciata*, from Kashiwajima Island, Kochi Prefecture, Japan

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**Abstract** A new gobiid fish, *Stonogobiops pentafasciata*, is described on the basis of four specimens from Kashiwajima Island, Kochi Prefecture, Japan. It differs from other species of the genus in having a diagonal black band from chin, through eye, to occiput; first dorsal fin rounded and clear; posterior part of pelvic fin jet black; scales on anterior part of body embedded.

Hoese and Randall (1982) revised the Indo-Pacific shrimp-associated gobiid fish genus *Stonogobiops*; they recognized four species: *S. dracula* Polunin and Lubbock, *S. medon* Hoese and Randall, *S. nematodes* Hoese and Randall, and *S. xanthorhynica* Hoese and Randall. Prince Akihito et al. (1984) illustrated and briefly diagnosed a fifth specimens of the genus as *Stonogobiops* sp. from the Kerama Islands, Okinawa Prefecture. A sixth species of the genus was found by the authors at Kashiwajima Island, Kochi Prefecture, Japan. The purpose of this paper is to describe this species.

### Materials and Methods

Measuring and counting procedures followed those of Hubbs and Lagler (1958) and Prince Akihito et al. (1984), except for the following: head depth and width were measured at the preopercular margin, body depth at the base of the pelvic fin, and body width at the base of the pectoral fin. Vertebral counts were made from radiographs. Notations of the cephalic lateral line system and relationship between the pterygiophores of the dorsal fins and vertebrae (P-V) follow those of Prince Akihito et al. (1984). Cephalic sensory organs were studied by staining the specimens with suminol cyanine.

Studied specimens are listed in the following order: catalogue number, sex, total number of specimens, standard length (SL), collection locality, and collection date. Catalogue abbreviations used are: AMS., Australian Museum, Sydney; BM(NH), The

National History Museum BLIH, London; Biological Laboratory, Imperial Household, Tokyo (LIAIP changed this abbreviation); and NSMT-P, Department of Zoology, National Science Museum, Tokyo.

### *Stonogobiops pentafasciata* sp. nov.

(New Japanese name: Kitsuneme-nejirinbō)

(Figs. 1, 2; Table 1)

**Holotype.** NSMT-P 45538, female, 32.6 mm, Kashiwajima Island (132°38'E, 32°45'N), Ōtsuki-cho, Hata-gun, Kochi Prefecture, Japan, V: 4: 1992.

**Paratypes.** BM(NH) 1993.9.7.2, female, 1, 24.6 mm, collection locality as for holotype, X: 20: 1991; BLIH 1991547, male, 1, 27.6 mm, collection locality as for holotype, X: 24: 1991; AMS I. 34235-001, female, 1, 27.6 mm, collection locality as for holotype, IV: 26: 1992.

**Diagnosis.** Five diagonal black bands on head and body, the first from chin, through the eye, to dorsal part behind eye. Posterior part of pelvic fin black. First dorsal fin round and transparent. Scales on anterior part of body embedded.

**Description** (data for the holotype is given first, followed by those for paratypes in parentheses, see also Figs. 1 and 2, and Table 1).

**Counts.**—Dorsal fins VI-I, 10 (VI-I, 10); anal fin I, 9 (I, 9); pectoral fin 17 (16–17); pelvic fin I, 5 (I, 5); upper half and lower half segmented caudal rays 9+8 (8–9+8); upper half and lower half branched caudal rays 7+6 (6–7+6); lateral and transverse scale rows uncountable; predorsal scales 0(0); P-V 3

/II II I I 0/9 (3/II II I I 0/9); vertebrae 10+16=26 (10+16=26).

**Measurements.**—Body depth at base of pelvic fin 5.3 (5.2–5.3) in SL, body depth at anal origin 6.9 (6.6–7.3) in SL, head length 3.1 (2.9–3.0) in SL, head width 1.1 (1.1–1.2) in head depth, snout length 4.4 (5.1–6.5) in head length, caudal peduncle length 2.4 (2.2–2.5) in head length, longest first dorsal spine (third) 7.4 (7.2–8.1) in SL, longest second dorsal ray (seventh–eighth) 6.2 (5.1–6.1) in SL, longest anal

ray (sixth–seventh) 6.5 (4.9–5.6) in SL, caudal fin 4.1 (3.4–4.1) in SL, longest pectoral fin ray (eighth–tenth) 4.8 (4.4–4.6) in SL, longest pelvic fin ray (fifth) 5.3 (5.1–5.6) in SL.

Head and body moderately compressed; body moderately elongate. Mouth large, the maxilla extending posteriorly to a vertical at rear edge of eye, and moderately oblique, forming an angle of about 25° to the horizontal axis of the head and body; lower jaw projects beyond upper; upper jaw with

**Table 1.** Proportional measurements in hundredths of standard length of holotype and paratypes of *Stonogobiops pentafasciata* sp. nov.

Catalogue number	Holotype	Paratypes		
	NSMT-P 45538	BM(NH) 1993.9.7.2	AMS I. 34235-001	BLIH 1991547
Standard length (mm)	32.6	24.6	27.6	27.6
Sex	female	female	female	male
Head length	32.5	34.1	33.7	33.3
Snout length	7.4	5.3	5.4	6.5
Maxillary length	20.9	20.7	19.2	20.3
Eye diameter	8.0	9.8	9.0	9.8
Interorbital width	2.8	1.6	1.8	1.4
Preanal length	60.7	60.6	61.2	59.4
Caudal peduncle length	13.5	13.8	15.6	15.2
Snout to first dorsal origin	39.9	41.1	39.5	41.7
Snout to first dorsal end	59.5	58.5	57.2	58.7
Snout to second dorsal origin	59.5	58.9	59.8	60.9
Snout to second dorsal end	86.2	85.8	85.5	87.0
Snout to anal origin	62.9	63.4	64.1	64.9
Snout to anal end	85.0	85.8	85.1	85.9
Head depth	17.8	19.1	17.4	18.5
Body depth at base of pelvic	19.3	19.1	18.8	18.8
Body depth at anal origin	14.4	14.6	15.2	13.8
Caudal peduncle depth	9.5	8.9	9.1	8.3
Head width	15.6	15.9	15.9	16.3
Body width at base of pelvic	12.6	12.6	10.9	12.0
Body width at anal origin	11.0	10.2	10.1	9.4
First dorsal base	19.9	18.7	18.8	17.8
Second dorsal base	27.9	27.6	26.8	26.1
Anal base	21.2	21.5	21.0	21.4
Pectoral base	8.6	9.3	7.2	8.7
Longest pectoral ray	20.9	21.5	22.8	21.4
	10th	8th=9th	10th	10th
Longest pelvic ray	18.7	19.5	19.6	17.8
	5th	5th	5th	5th
Longest first dorsal spine	13.5	13.8	12.3	13.0
	3rd	3rd	3rd	3rd
Longest second dorsal ray	16.3	19.5	18.1	16.3
	8th	8th	7th	7th
Longest anal ray	15.3	20.3	18.1	17.8
	6th	7th	6th	7th
Caudal length	24.2	29.7	27.5	24.6
Lower jaw length	20.9	21.5	20.7	21.7

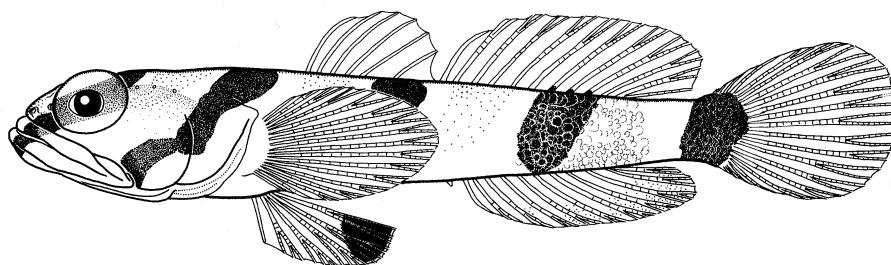


Fig. 1. *Stonogobiops pentafasciata* sp. nov., BLIH 1991547, paratype, male, 27.6 mm SL.

three rows of slender, slightly incurved, conical teeth anteriorly, narrowing to one row posteriorly; lower jaw with two rows anteriorly, narrowing to one row posteriorly, the shape of teeth same as in upper jaw; teeth in outer row in lower jaw larger; prevomer with one stout recurved conical tooth, without prominent ventral extension on each side; palatines with a blunt triangular ridge bearing two to six tooth-like projections on outer edge, height of the ridge greater toward posterior corner, posterior angle of the ridge protruding from outer margin of lower jaw and reaching to inner side of lower lip. Tongue free from floor of mouth, tip rounded. Snout slightly convex. Gill opening wide, extending to a point below and midway between posterior end of preoperculum and posterior edge of eye; gill membranes united across the isthmus. Anterior nostril in a short tube placed near upper lip, posterior nostril a pore close to rim of eye. Interorbital space narrow, the least width smaller than pupil diameter. A shallow groove around posterodorsal margin of eye. Scales small and weakly cycloid, embedded on anterior part of body; longitudinal and transverse scale rows difficult to count. Head, predorsal area, pectoral base and thorax scaleless. BLIH 1991547 has many small low swellings on posterior part of body below posterior half of second dorsal base (Fig. 1); [BM (NH) 1993.9.7.2 and NSMT-P 45538 also have them, but weakly, AMS I. 34235-001 absent].

Origin of first dorsal fin about one eye diameter posterior to upper end of gill opening; margin of dorsal fin rounded, third dorsal spine longest. Posterior end of first dorsal fin attached to insertion of second dorsal fin (posterior end of first dorsal fin of NSMT-P 45538 continued to first dorsal spine of second dorsal as a low membrane). Rays of second dorsal fin progressively longer to seventh or eighth. Origin of anal fin beneath base of second ray of second dorsal fin; rays of anal fin progressively

longer to sixth or seventh. Caudal fin rounded. Pectoral fin weakly pointed, the eighth to tenth ray longest. Pelvic fins fully united; pelvic frenum and connecting membrane well developed; fifth pelvic ray longest, not reaching anus when fin depressed.

*Cephalic lateral line system* (Fig. 2).—Cephalic sensory system has anterior oculoscapular canal with pores B', C(S), D(S), E, F, G and H'; preopercular canal with M' and O'. Arrangement of sensory papillae not highly developed.

*Sexual dimorphism*.—No sexual dimorphism except for the shape of urogenital papilla, pointed in male, roundish or rounded in female.

*Color when fresh*.—Five diagonal brownish black bands about half width of interspaces, the first from chin, through the eye, to occiput, the second from posterior end of maxilla to dorsoposterior part of preopercle, then rising more strongly to nape, the third from abdomen to below posterior part of first dorsal fin, the fourth from base of third to sixth anal rays to base of sixth to eighth second dorsal rays, and the last on posterior part of caudal peduncle, the posterior upper half end terminating at caudal fin base. Interspaces of black bands ivory white (NSMT-P 45538 and AMS I. 34235-001, with a small pale blackish blotch on posterior part of eye). Some melanophores on dorsal side of mid-part of first, second, and third interspaces between black bands (BLIH 1991547, melanophores absent on first interspace). Dorsoanterior and ventroposterior parts of iris white. Abdomen white. First and second dorsal fins, caudal fin, and pectoral fins clear. Some melanophores on outer half of posterior part of anal fin. Posterior two-thirds of pelvic fins jet black, remaining area bright white.

*Color in alcohol*.—No remarkable changes present except follows: all of iris black; ivory white of interspace between black bands changed dull white; bright white of pelvic fin changed dull white.

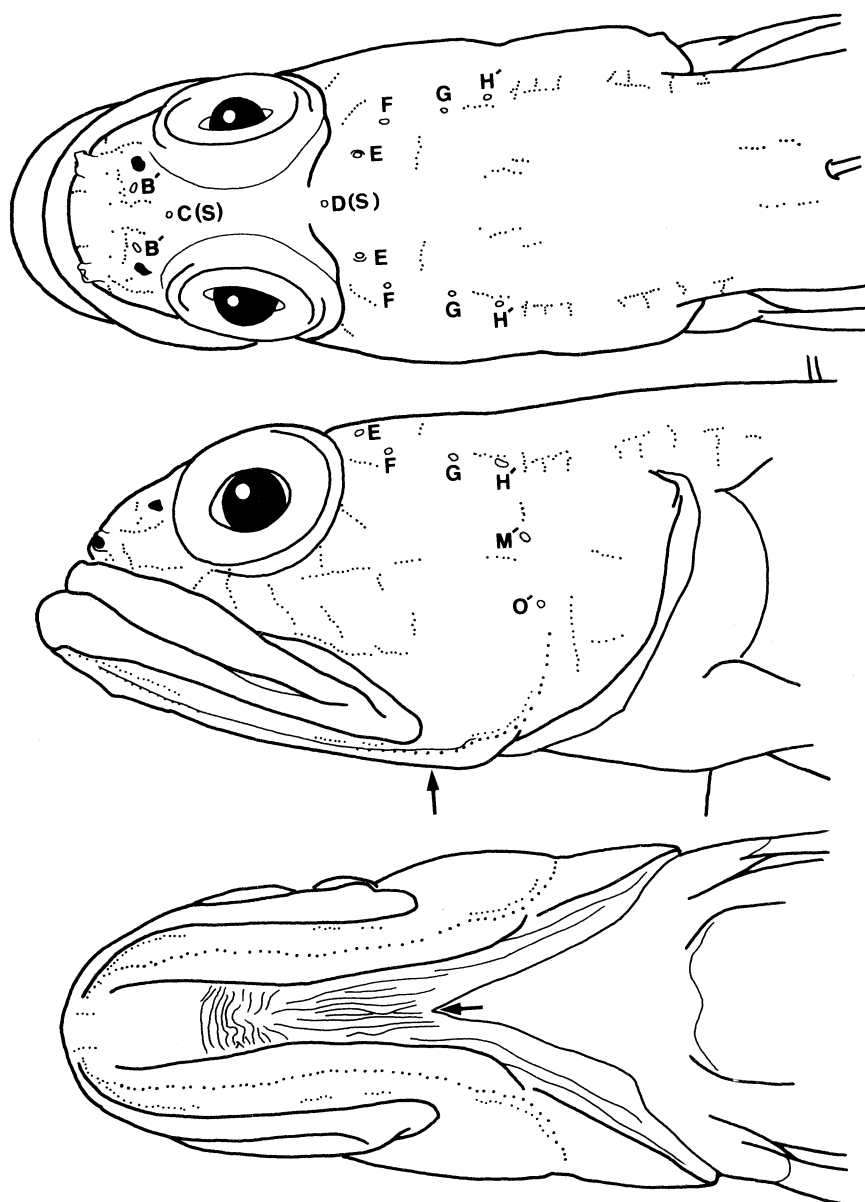


Fig. 2. Cephalic lateral line system of dorsal, lateral and ventral side of *Stonogobiops pentafasciata* sp. nov., holotype, NSMT-P 45538 (32.6 mm SL). Dots represent the pit organs; open circles, the sensory canal pores; and the arrow points to the position where the gill membranes are attached to the isthmus.

**Distribution.** Known only from Kashiwajima Island, Kochi Prefecture, Japan.

**Etymology.** Named *pentafasciata* from five black bars on head and body.

**Ecological note.** This species occurs on slopes of

clear and fine sand. It have been found in the depth range of 18–40 m, but mainly about 30 m. It lives in symbiotic association with alpheid shrimps. The shrimps are almost always *Alpheus randalli*, and rarely *A. bellulus*. This goby hovers a few centimeters above the bottom at the entrance to its burrow. It is sometimes seen in pairs. The spawning

season may be long, as females with a large abdomen have been seen from April to October. AMS I. 34235-001 expelled ripe eggs just after being captured on April 26, 1992.

**Remarks.** This species resembles *Stonogobiops dracula* in having sensory pores on the head and preopercular margin, in the number of second dorsal and anal fin rays, and in the rounded first dorsal fin. *S. pentafasciata*, however, is clearly distinguished from *S. dracula* as follows: diagonal black band present on head from chin, through eye, to occiput (vs. no diagonal black band on anterior part of head), no red line in the spaces between dark bars on body (vs. red line bisects the spaces between dark bars on body), first dorsal fin clear (vs. posterior part of first dorsal fin dark), posterior part of pelvic fin jet black (vs. posterior part of pelvic fin white), black band on caudal peduncle diagonal (vs. black band on caudal peduncle vertical), head rather pointed (vs. head rounded), scales on anterior part of body embedded and longitudinal and transverse scale rows difficult to count (vs. longitudinal and transverse scale rows countable) and angle of jaws about 25° (vs. 35°).

*S. pentafasciata* does not exceed 35 mm SL; it appears to be the smallest species of this genus.

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#### Literature Cited

- Akihito, Prince, M. Hayashi, T. Yoshino, K. Shimada, H. Senou and T. Yamamoto. 1984. Suborder Gobioidae. Pages 236-289, pls. 235-258, 353-355, in H. Masuda, K. Amaoka, C. Araga, T. Uyeno and T. Yoshino, eds. The fishes of the Japanese Archipelago. English text and plates. Tokai Univ. Press, Tokyo. xxii + 437 pp., 370 pls.
- Hoesé, D. F. and J. E. Randall. 1982. Revision of the gobiid fish genus *Stonogobiops*. Indo-Pacific Fishes, (1): 1-18, pls. 1-3.
- Hubbs, C. L. and K. F. Lagler. 1958. Fishes of the Great Lakes region. Bull. Cranbrook Inst. Sci., 26: 1-213.

高知県柏島から採集されたハゼ科の1新種キツネメネジリンボウ

岩田 久・平田 智法

高知県柏島から得られた4個体の標本を基にハゼ科ネジリンボウ属の1種 *Stonogobiops pentafasciata* キツネメネジリンボウを記載した。本種は頭から始まって眼を通り、眼後方の頂部背面に向かう黒色斜走帯があること；円形で透明な第1背鰭を持つこと；腹鰭後方が漆黒色であること；体前方の鱗が埋没していることで他の本属魚類と明瞭に識別される。

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